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UNIVERSITY OF ILLINOIS  
DIGITAL COMPUTER LABORATORY  
GRADUATE COLLEGE

INTERNAL REPORT NO. 55  
REORGANIZATION OF ILLIAC LIBRARY

BY

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1/9/54





## REORGANIZATION OF ILLIAC LIBRARY

### 1. Renumbering of Routines

An entirely new labelling system has been set up for the routines in the Illiac library. All routines in current use have been assigned new labels according to the new system, and therefore each have two labels, an old one and a new one. It is anticipated that the old labels will soon fall into disuse. New routines will carry only one label, in the new system. Obsolete routines will not be renumbered and will bear only the old label.

The old labels were simply numbers. Each new label consists of a letter (or possibly two letters) followed by a number. The library has been divided into categories according to the types of operations performed, and the letter in a label denotes the category to which the routine belongs. Occasionally a routine, though belonging to one category, is useful only in connection with operations in another category; in such cases the letter of the latter category has been added as a second letter (most of these cases are floating decimal auxiliaries). The number is simply a serial number within the category.

A list of categories is given in Appendix 1.

### 2. Summary Sheets

For some routines there have already been prepared summary sheets stating concisely all the facts required in order to use each routine as it is intended to be used, and no more. These sheets do not give the code itself, nor a description of the methods used. They do, however, give enough information to enable the routine to be used correctly and to be compared for usefulness with another routine of the same type.

These summaries will be provided for all routines now in common use. Every group using the Illiac will be issued a folder containing the summaries, arranged according to category in alphabetical order, and further copies of summaries may be obtained from Mrs. Brown.

The write-up of every future routine will be in two parts:

1. a summary,
2. a description of the method used, with the code itself.

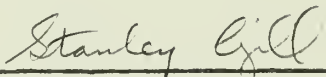


Only the former will be circulated. Copies of the latter will be available for consultation in the teletype room; users who must make frequent reference to them may obtain copies for their own use from Mrs. Brown. Complete copies of all existing and obsolete codes will also be kept in the teletype room.

### 3. Code Tapes

Effective February 1, 1954, library tapes will be labelled and filed according to the new system.

- |             |    |                            |
|-------------|----|----------------------------|
| Appendices: | 1. | List of categories         |
|             | 2. | New labels in terms of old |
|             | 3. | Old labels in terms of new |

  
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## APPENDIX I

### ILLIAC LIBRARY CATEGORIES

#### Programmed Arithmetic

- A. Floating Point
- B. Other programmed arithmetic

#### Code Checking

- C. Post Mortem checks
- D. Dynamic code checks

#### Integration

- E. Quadrature
- F. Ordinary differential equations
- G. Partial differential equations

#### Operations on Functions

- H. Zeros and minima
- I. Interpolation
- J. Operations on polynomials and power series
- K. Approximations and statistics

#### Linear Algebra

- L. Simultaneous linear equations
- M. Other operations on matrices and vectors

#### Input and Output

- N. Number input
- O. Scope output
- P. Printing and punching

#### Mathematical Logic

- Q. Mathematical logic

#### Particular Functions

- R. Roots and fractional powers
- S. Logarithmic, exponential and hyperbolic functions
- T. Trigonometrical functions
- V. Other special functions



Organizational

- W. Counting, sorting and selecting
- X. Program preparation

Miscellaneous

- Z. Miscellaneous complete programs





APPENDIX II

NEW LABELS IN TERMS OF OLD

18.	X1	Decimal Order Input
23.	N3	Decimal Number Sequence Input
25.	P6	Single Column Print
28.	P9	Decimal Order Print Routine
31.	T2	Arctan X Subroutine
35.	D3	Sequence Checking Routine
37.	P5	Print One Number in a Parameter Set Layout
39.	D2	Full Printing Checking Routine
40.	E1	Integration Routine for $f(x)$ given at Equal Increments of $x$
43.	S1	Natural Logarithm
45.	E1	Double Precision Arithmetic
48.	C1	Post Mortem Version of the Decimal Order Input
50.	E2	Complex Numbers Operations
52.	P2	Print (A) with or without sign to $n$ places as determined by a program parameter.
53.	P3	Print $n$ digits of an integer with or without a sign
54.	P8	Tape Lettering
55.	P4	Zero Suppression Integer Print
60.	K1	Best Least-Squares Straight Line
61.	N1	Input One Number from Tape, Integer or Fraction
62.	Q2	Logical Input Variable Subroutine
63.	A1	Floating Decimal Arithmetic Routine
64.	S2	Exponential
65.	X4	Standard Routines
66.	T1	Sine Cosine
67.	I1	Interpolation
68.	R4	Cube Root
69.	C2	Address Search Routine
70.	D4	Control Transfer Check
71.	H1	Inverse Interpolation
72.	H2	A Search for the Real Roots of $f(x) = 0$
75.	P1	Print One Number Fractional or Integer in a Manner Determined by a Program Parameter
76.	X6	Sum Memory and Check, Interlude



## APPENDIX II Continued --

77.	T3	Arctangent in Degrees
78.	G1	LaPlace's Equation - Liebmann Method
79.	Z1	Refraction Code
80.	H3	Minimization of a Function of Two Variables
81.	Q1	Logical Algebra
82.	V1	Legendre Polynomials
84.	H4	Minimization of a Function of 4 Variables
85.	H5	Minimization of a Function of n Variables
86.	H6	Minimization of a Function of n Variables - Treating One Variable at a Time
87.	A4	Revised 1.7 Precision Floating Decimal
88.	N2	Input a Sequence of Decimal Fractions
89.	W1	Loop Cycling Control
90.	X3	Constant Listing Auxiliary
91.	M1	Matrix Multiplication
92.	RA1	Floating Decimal Square Root Auxiliary
93.	D5	Iteration Counter
94.	C3	Post Mortem for Fractions and their Locations
95.	D1	Check Point Routine
96.	SA1	Floating Decimal Logarithm Auxiliary
97.	C4	Post Mortem for Integers and their Locations
98.	G2	Poisson's Equation - Liebmann - Frankel Method
99.	RA2	Floating Decimal Cube Root Auxiliary
100.	L3	Complete Linear Equation Solver
101.	V3	Sequence of Random Numbers with Optional Preparatory Interlude
103.	C5	Print Sets of Order Pairs and their Locations
104.	MA1	Matrix Multiplication with Floating Decimal Auxiliary
105.	R2	Integral Root $A^{1/p}$
106.	R3	Fractional Power Routine
107.	X5	Arithmetic Programming
108.	X2	Shifting Sum Check
110.	CO1	Post Mortem for Fractions and their Locations
111.	HF1	Zero of a Solution of a Differential Equation



APPENDIX II Continued --

112.	L1	Solution of a Set of Simultaneous Linear Algebraic Equations
113.	L2	Automatic Linear Equation Solver
114.	F1	Solution of a System of Ordinary Differential Equations
115.	F2	Solution of a System of Differential Equations by Milne's Iterative Method
116.	R1	Square Root Routine
117.	M3	New Automatic Eigenvalue-Eigenvector Program
118.	M2	Automatic Inversion of a Symmetric Matrix
119.	O1	Routine to Plot Points and Axes
120.	V2	Tchebyscheff Polynomials
121.	KA1	Floating Point Constant Listing Auxiliary
122.	FA1	Floating Decimal Boundary Value Differential Equation Auxiliary
123.	KA1	Polynomial Approximation
124.	P7	Letter Printing
125.	A3	Convert a Number from Floating Decimal Representation to Normal Machine Form
126.	TA1	Sine Auxiliary for Floating Decimal
127.	SA2	Exponential Auxiliary for Floating Decimal
128.	A2	Floating Decimal Tape with Standard Auxiliary



APPENDIX III

OLD LABELS IN TERMS OF NEW

A1	63	M3	117
A2	128	MA1	104
A3	125		
A4	87	N1	61
		N2	88
B1	45	N3	23
B2	50		
		O1	119
C1	48		
C2	69	P1	75
C3	94	P2	52
C4	97	P3	53
C5	103	P4	55
CO1	110	P5	37
		P6	25
D1	95	P7	124
D2	39	P8	54
D3	35	P9	28
D4	70		
D5	93	Q1	81
		Q2	62
E1	40		
		R1	116
F1	114	R2	105
F2	115	R3	106
FA1	122	R4	68
		RA1	92
G1	78	RA2	99
G2	98		
		S1	43
H1	71	S2	64
H2	72	SA1	96
H3	80	SA2	127
H4	84		
H5	85	T1	66
H6	86	T2	31
HF1	111	T3	77
		TA1	126
I1	67		
		V1	82
K1	60	V2	120
KA1	123	V3	101
L1	112	W1	89
L2	113		
L3	100	X1	18
		X2	108
M1	91	X3	90
M2	118	X4	65
		X5	107
		X6	76
		KA1	121















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